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Removing Grease Stains from Concrete

Procedure code:

371001S

Division:

Concrete

Section:

Concrete Cleaning

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PREFACE

The cleaning or removal of stains from concrete may involve the use of liquids, detergents or solvents which may run off on adjacent material, discolor the concrete or drive the stains deeper into porous concrete. Use the products and techniques described here only for the combinations of dirt/stain and concrete specified.

PART 1---GENERAL

1.01 SUMMARY

A. This specification provides guidance on removing grease stains from concrete by washing with an alkaline compound, or poulticing with chemical solvents.

B. Safety Precautions:

1. Do not save unused portions of stain-removal materials.
2. Do not store any chemicals in unmarked containers.
3. Excellent ventilation must be provided wherever any solvent is used. Use respirators with solvent filters. Note: some of the solvents listed are known carcinogens and may be banned in some states.
4. No use of organic solvents indoors should be allowed without substantial air movement. Use only spark-proof fans near operations involving flammable liquids.
5. Provide adequate clothing and protective gear where the chemicals are indicated to be dangerous.
6. Have available antidote and accident treatment chemicals where noted.

C. Read "General Project Guidelines" along with this specification. These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Regional Historic Preservation Officer (RHPO). The guidelines cover the following sections:

1. Safety Precautions
2. Historic Structures Precautions
3. Submittals
4. Quality Assurance
5. Delivery, Storage and Handling
6. Project/Site Conditions
7. Sequencing and Scheduling
8. General Protection (Surface and Surrounding)

D. For additional information on poulticing, see "Removing Unknown Stains from Marble Using a Poultice".

PART 2---PRODUCTS

2.01 MATERIALS

CAUTION: The use of strong acids can etch and disintegrate the concrete surface.

Note: Chemical products are sometimes sold under a common name. This usually means that the substance is not as pure as the same chemical sold under its chemical name. The grade of purity of common name substances, however, is usually adequate for stain removal work, and these products should be purchased when available, as they tend to be less expensive. Common names are indicated below by an asterisk (*).

A. For Washing:

1. Masonry Cleaner suitable for use on concrete:

- a. Adequate surfactants and emulsifiers to loosen soil and to keep it in solution until rinsed away.
- b. May contain the active ingredient hydrofluoric acid - its reaction with soil is often a gas rather than a salt.

NOTE: Ingredients which produce salt solutions, such as sulfuric acid should not be present, though many commercial cleaners contain this ingredient.

2. Trisodium phosphate

- a. NOTE: This chemical is banned in some states such as California. Regulatory information as well as alternative or equivalent chemicals may be requested from the Environmental Protection Agency (EPA) Regional Office and/or the State Office of Environmental Quality.
- b. Other chemical or common names include Tribasic sodium phosphate; Trisodium orthophosphate; Sodium orthophosphate, TSP*; Phosphate of soda*.
- c. Potential Hazards: CAUSTIC TO FLESH.
- d. Available from chemical supply distributor, supermarket, grocery, or hardware store.

3. Scouring Powder

-OR-

Sodium Metasilicate - powder (Na_2SiO_3):

- a. A toxic corrosive crystalline salt used especially as a detergent or as a substitute for phosphates in detergent formulations.
- b. Other chemical or common names include sodium silicate; Liquid glass; Silicate of soda; Soluble glass; Water glass.
- c. Potential Hazards: CAUSTIC TO FLESH.
- d. Available from chemical supply house, construction specialties distributor, or hardware store.

B. For Poulticing:

1. Use one of the following solvents in a poultice (see Section 3.02 below for related procedures):

Trisodium Phosphate:

- a. Strong base-type powdered cleaning material sold under brand names.
- b. NOTE: This chemical is banned in some states such as California. Regulatory information as well as alternative or equivalent chemicals may be requested from the Environmental Protection Agency (EPA) Regional Office and/or the State Office of Environmental Quality.
- c. Other chemical or common names include Tribasic sodium phosphate; Trisodium orthophosphate; Sodium orthophosphate, TSP*; Phosphate of soda*.
- d. Potential Hazards: CAUSTIC TO FLESH.
- e. Available from chemical supply distributor, supermarket, grocery, or hardware store.

-OR-

Benzene (C_6H_6):

- a. A colorless, volatile, flammable, toxic, liquid, aromatic hydrocarbon used in organic synthesis, as a solvent and as a motor fuel.
- b. Other chemical or common names include Benzol; Benzole; Phene; Phenyl hydride; Coal naphtha*; Motor benzol*.
- c. Potential Hazards: FLAMMABLE.
- d. Available from automotive supply distributor, chemical supply house, dry cleaning supply distributor, hardware store or paint store.

-OR-

Carbon Tetrachloride (CCl_4):

- a. A colorless, nonflammable, toxic liquid that has an odor resembling chloroform and is used as a solvent (as in dry-cleaning) and a fire extinguisher.

- b. Other chemical or common names include Perchloromethane; Tetrachloromethane.
- c. Potential Hazards: TOXIC.
- d. Available from chemical supply house, dry cleaning distributor, hardware store, paint store or photographic supply distributor (not camera shop).

-OR-

Chloroform (CHCl₃):

- a. A colorless volatile heavy toxic liquid with an ether odor used especially as a solvent or as a general anesthetic.
- b. Other chemical or common names include Methylene trichloride; Trichloromethane.
- c. Potential Hazards: TOXIC.
- d. Available from chemical supply house, dry cleaning supply distributor, drugstore or pharmaceutical supply distributor, or paint store.

-OR-

Mineral Spirits:

- a. A petroleum distillate that is used especially as a paint or varnish thinner.
- b. Other chemical or common names include Benzine* (not Benzene); Naphtha*; Petroleum spirits*; Solvent naphtha*.
- c. Potential Hazards: TOXIC AND FLAMMABLE.
- d. Safety Precautions:
 - Avoid repeated or prolonged skin contact.
 - Always wear rubber gloves when handling mineral spirits.
 - If any chemical is splashed onto the skin, wash immediately with soap and water.
- e. Available from construction specialties distributor, hardware store, paint store, or printer's supply distributor.

-OR-

Sodium Carbonate (Na₂CO₃):

- a. A sodium salt of carbonic acid used especially in making soaps and chemicals, in water softening, in cleaning and bleaching and in photography; A hygroscopic crystalline anhydrous strongly alkaline salt.
- b. Other chemical or common names include Carbonate of soda*; Sal soda*; Soda*; Soda ash*; Washing soda*.
- c. Available from chemical supply house, grocery store or supermarket, hardware store, paint store, or water and sanitation supply distributor.

-OR-

Trichloroethylene (highly refined solvent):

- a. Caution: Trichloroethylene is highly toxic and may react with strong alkalis such as fresh concrete to form dangerous gases.
- b. Other chemical or common names include Ethinyl trichloride.
- c. Potential Hazards: TOXIC.
- d. Available from automotive supply distributor, chemical supply house (both commercial and scientific), dry cleaning supply distributor, paint store, photographic supply distributor (not camera shop), or printer's supply distributor.

2. Filler material such as whiting, diatomaceous earth or talc.

3. Mineral water.

4. Clean dry towels for blotting the area after treatment.

C. Clean, potable water.

D. Accessible source of water, soap and towels for washing and rinsing in case of emergencies associated with the use of chemicals.

2.02 EQUIPMENT

A. Garden hose and pneumatic spray nozzle.

B. Stiff bristle brushes (non-metallic).

C. Wood or plastic spatulas.

D. Poulticing Materials:

1. Glass or ceramic container for mixing the solution.

2. Wooden utensil for stirring the ingredients.

PART 3---EXECUTION

2.01 EXAMINATION

Examine the concrete surface carefully to determine the cause of staining before proceeding with any cleaning operation.

2.02 PREPARATION

Protection:

A. Provide adequate wash solutions (i.e. water, soap and towels) before starting the job.

B. Whenever acid is used, the surface should be thoroughly rinsed with water as soon as its action has been adequate. Otherwise it will continue etching the concrete even though the stain is gone.

3.03 ERECTION, INSTALLATION, APPLICATION

CAUTION: Volatile, flammable solvents such as gasoline should not be used to clean oil or grease stains. These often cause the soil to penetrate further into the concrete. Note: do not try more than one treatment on a given area unless the chemicals used from prior treatment have been washed away.

A. Always pre-wet the surface thoroughly before using any cleaning solution on a concrete surface.

B. Washing Grease Stains:

NOTE: Do not use soap on concrete. It reacts with the lime in the concrete and forms a scum which will cause the concrete to soil more rapidly.

1. Using a wood or plastic spatula, scrape excess grease from the surface.
2. Scrub any remaining stain with scouring powder, sodium orthophosphate or detergent, following the manufacturer's instructions.

-OR-

1. Mix about 4 oz. of sodium metasilicate powder per gallon of water.
2. Using a stiff bristle brush, scrub the stained area with this solution.
3. Thoroughly rinse the surface with clean, clear water and allow to dry.

C. Poulticing Grease Stains:

1. Mix whiting and trisodium phosphate to form a thick paste.

-OR-

Prepare a poultice using benzene, mineral spirits or one of the chlorinated solvents listed in Section 2.01 B above. Note the precaution in Section 3.02 A.3. above.

2. Apply the paste to the stained surface in a layer 1/8" - 1/4" thick and allow to dry.
3. Scrape off the dried paste with a wooden spatula.
4. Thoroughly rinse the surface with clean, clear water and allow to dry.
5. Repeat the process as necessary to achieve the desired level of cleanliness.
6. Scrub the surface again, as needed, with scouring powder, sodium orthophosphate, detergent or a proprietary cleaner formulated for the purpose.